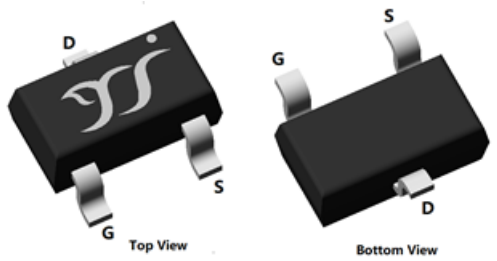
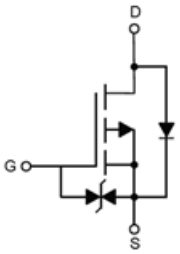
P-Channel Enhancement Mode Field Effect Transistor



SOT-23-3L



Product Summary

- V_{DS} -30V
- I_D -2.7A
- $R_{DS(ON)}$(at V_{GS}=-10V) ＜85mΩ
- $R_{DS(ON)}$(at V_{GS}=-4.5V) ＜125mΩ
- ESD Protected Up to 2KV (HBM)

General Description

- High Speed switching
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL94 V-0 Flammability Rating
- Halogen Free

Applications

- PWM applications
- Power management
- Load switch

■ Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-source Voltage			V_{DS}	-	-30	V
Gate-source Voltage			V_{GS}	-20	20	
Continuous Drain Current (Note 1,2)	Steady-State	T_A=25℃,V_{GS}=-10V	I_D	-	-2.7	A
		T_A=100℃,V_{GS}=-10V		-	-1.9	
Pulsed Drain Current	T_A=25℃,t_p≤10μs		I_{DM}	-	-22	
Maximum Body-Diode Continuous Current	T_A=25℃		I_S	-	-1.3	
Total Power Dissipation (Note 1,2)	Steady-State	T_A=25℃	P_D	-	0.95	W
		T_A=100℃		-	0.38	
Junction and Storage Temperature Range			T_J ,T_{STG}	-55	150	℃

■Thermal Resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	$R_{\theta JA}$	-	131	℃/W

■ Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=-250μA,Tj=25℃	-30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V,V_{GS}=0V,Tj=25℃	-	-	-1	μA
		V_{DS}=-30V,V_{GS}=0V,Tj=125℃	-	-	-100	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V,Tj=25℃	-	-	±10	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA,Tj=25℃	-1.0	-1.5	-2.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V,I_D=-1.8A,Tj=25℃	-	66	85	mΩ
		V_{GS}=-4.5V,I_D=-0.9A,Tj=25℃	-	96	125	mΩ
Diode Forward Voltage	V_{SD}	I_S=-1.8A,V_{GS}=0V,Tj=25℃	-	-0.86	-1.2	V
Gate Resistance	R_G	f=1MHz,Tj=25℃	-	19	-	Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=-15V,V_{GS}=0V,f=1MHz,Tj=25℃	-	213	-	pF
Output Capacitance	C_{oss}		-	40	-	
Reverse Transfer Capacitance	C_{rss}		-	29	-	
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=-10V,V_{DS}=-15V,I_D=-1.8A,Tj=25℃	-	5.5	-	nC
Gate-Source Charge	Q_{gs}		-	0.25	-	
Gate-Drain Charge	Q_{gd}		-	0.85	-	
Reverse Recovery Charge	Q_{rr}	I_F=-1.8A,di/dt=100A/μs,V_{GS}=0V, V_R=-15V,Tj=25℃	-	18	-	nC
Reverse Recovery Time	t_{rr}		-	45	-	ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=-10V,V_{DS}=-15V,I_D=-1.8A,R_L=8.3Ω, R_{GEN}=3Ω,Tj=25℃	-	4.5	-	ns
Turn-on Rise Time	t_r		-	2.3	-	
Turn-off Delay Time	$t_{D(off)}$		-	16	-	
Turn-off Fall Time	t_f		-	11	-	

Note：

1. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
2. The value of $R_{\theta JA}$ is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in^2 pad of 2oz. Copper, in the still air environment with T_A=25℃.The maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

■Typical Electrical and Thermal Characteristics Diagrams

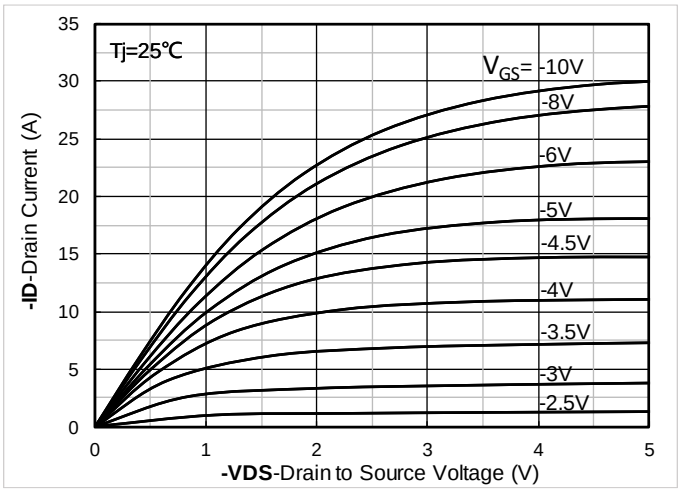


Figure 1. Output Characteristics; typical values

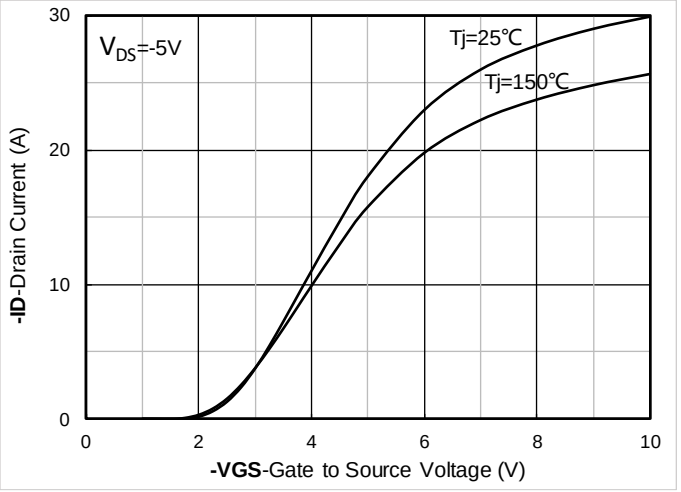


Figure 2. Transfer Characteristics; typical values

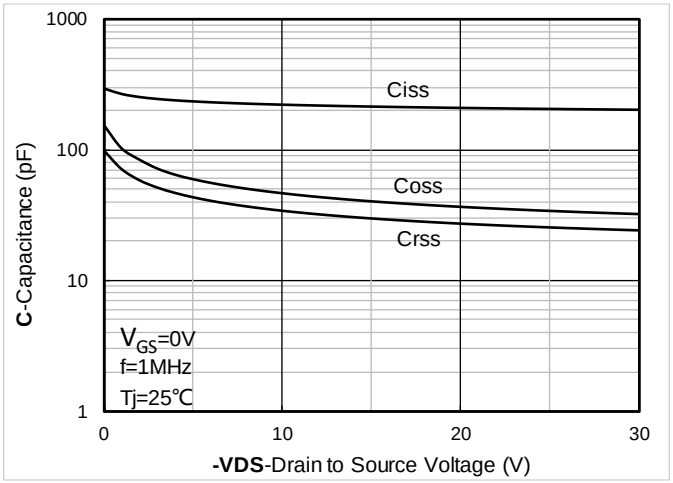


Figure 3. Capacitance Characteristics; typical values

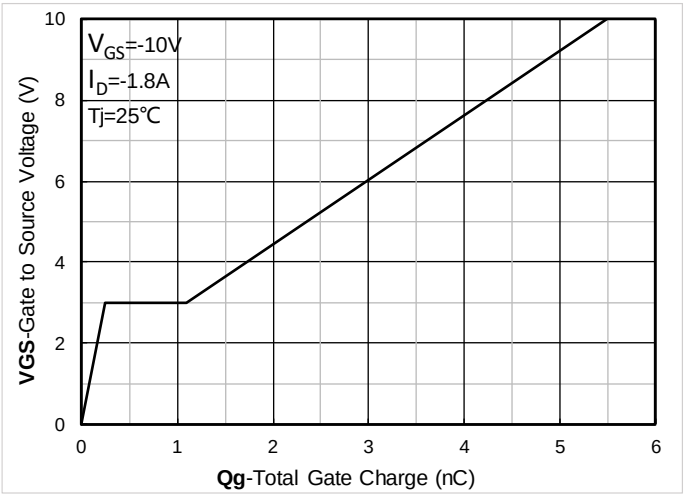


Figure 4. Gate Charge; typical values

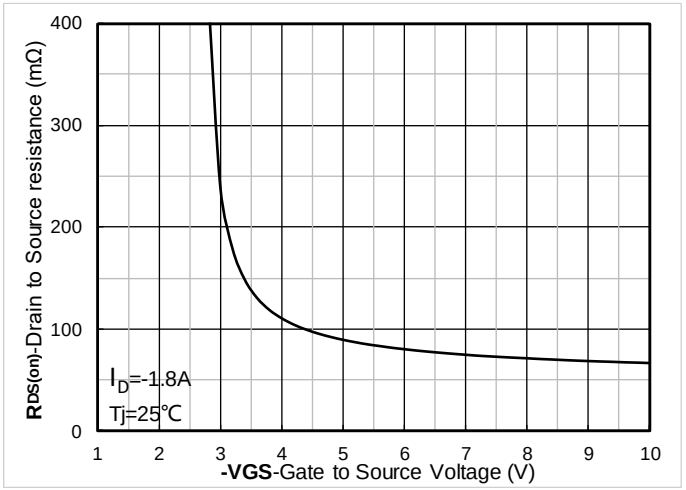


Figure 5. On-Resistance vs Gate to Source Voltage; typical values

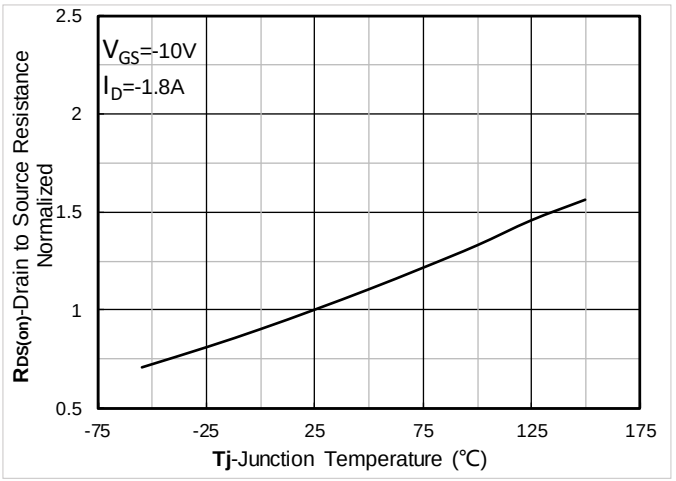


Figure 6. Normalized On-Resistance

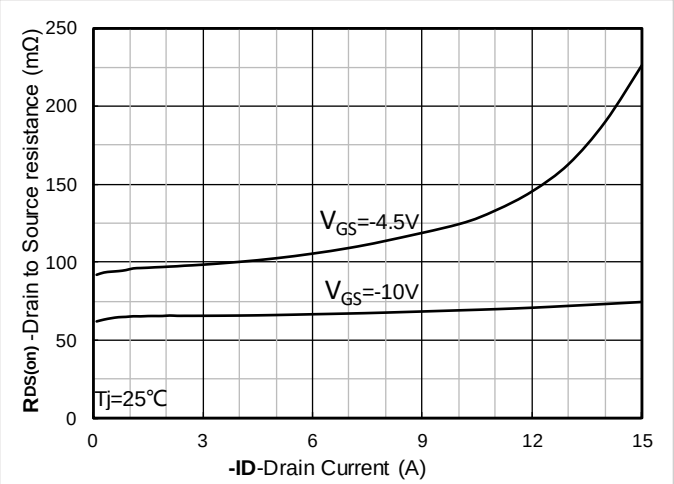


Figure 7. $R_{DS(on)}$ VS Drain Current; typical values

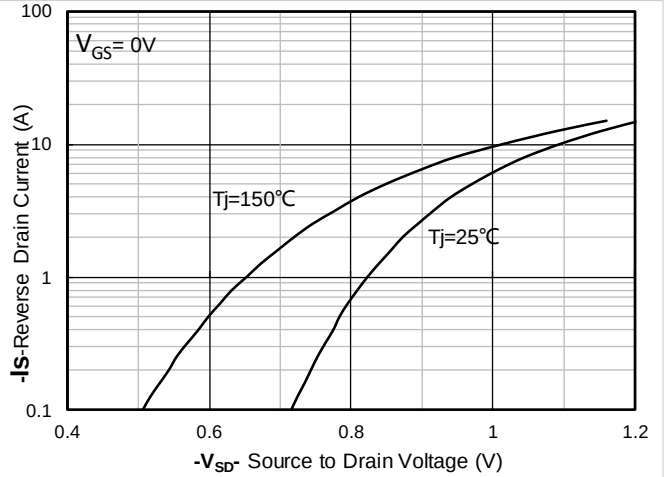


Figure 8. Forward characteristics of reverse diode; typical values

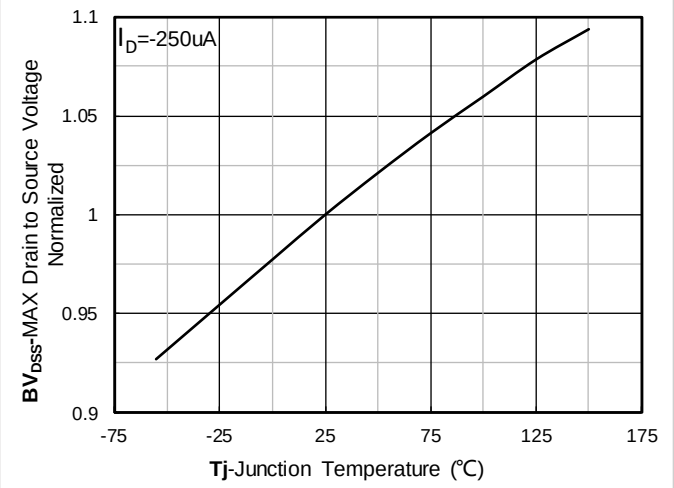


Figure 9. Normalized breakdown voltage

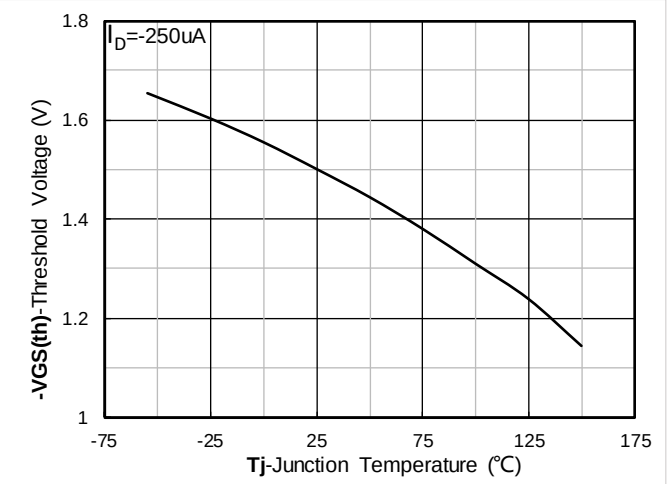


Figure 10. Gate Threshold voltage; typical values

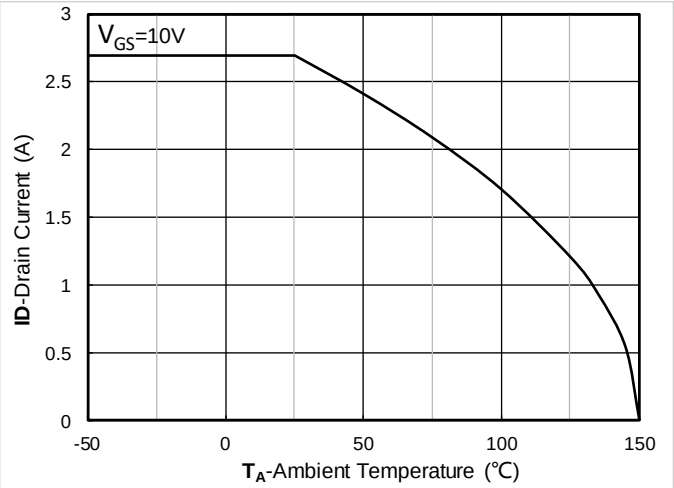


Figure 11. Current dissipation

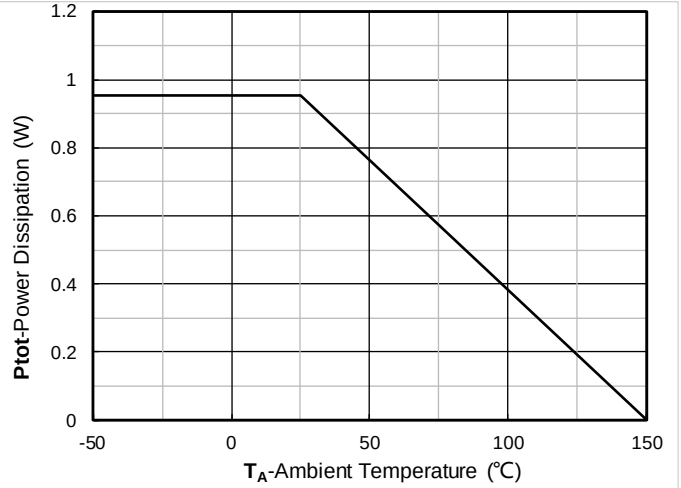


Figure 12. Power dissipation

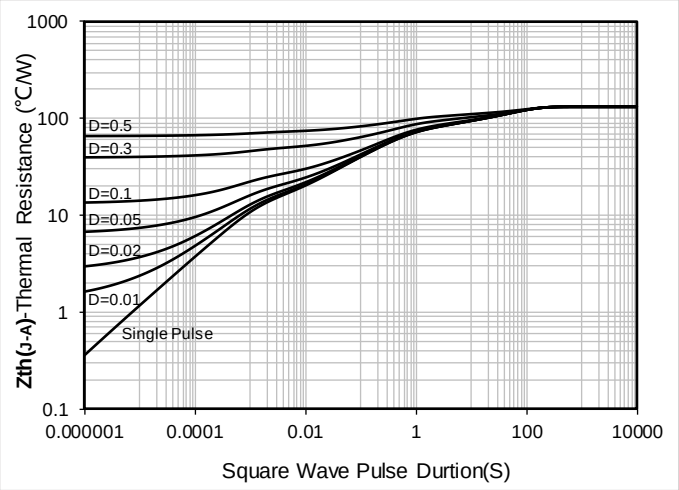


Figure 13. Maximum Transient Thermal Impedance

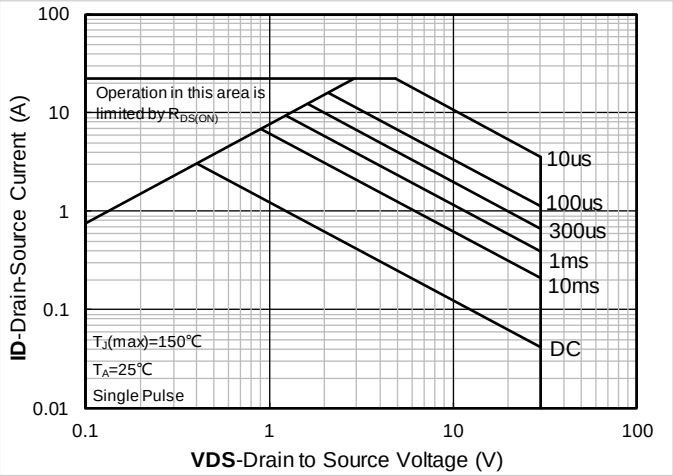
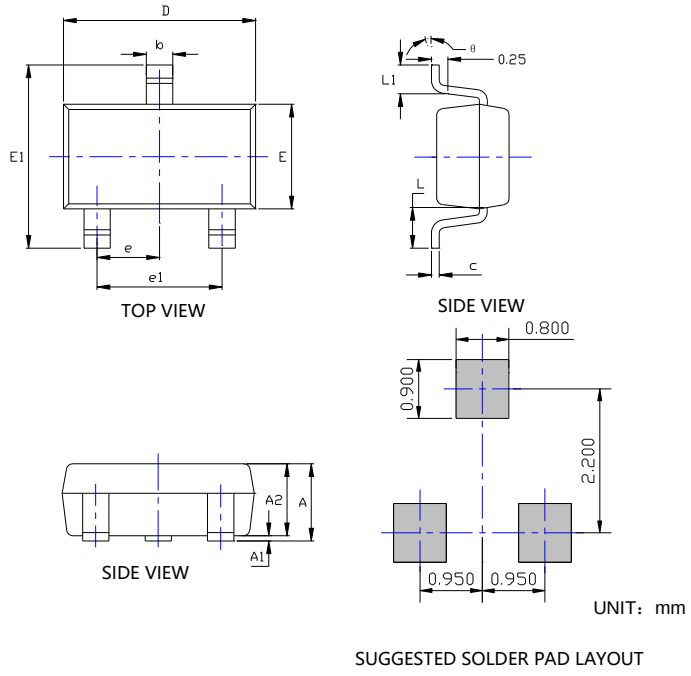


Figure 14. Safe Operation Area

■ SOT-23-3L Package Information

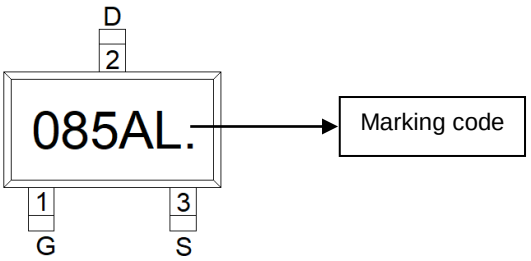


SUGGESTED SOLDER PAD LAYOUT

DIMENSIONS						
SYMBOL	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.041	---	0.049	1.050	---	1.250
A1	0.000	---	0.008	0.000	---	0.200
A2	0.041	0.043	0.045	1.050	1.100	1.150
b	0.012	0.016	0.020	0.300	0.400	0.500
c	0.004	---	0.008	0.100	---	0.200
D	0.111	0.115	0.119	2.820	2.920	3.020
E	0.059	0.063	0.067	1.500	1.600	1.700
E1	0.104	0.110	0.116	2.650	2.800	2.950
e	0.037TYP			0.950TYP		
e1	0.071	0.075	0.079	1.800	1.900	2.000
L	0.024REF			0.600REF		
L1	0.012	0.018	0.024	0.300	0.450	0.600
θ	0°	---	8°	0°	---	8°

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

■ Marking Information



Note：
1. All marking is at middle of the product body
2. All marking is in laser printing
3. 085AL. is marking code
4. Body color: Black

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